IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A noise suppression device comprising:

a time to frequency converter configured to perform frequency analyzation of an input time domain signal for conversion to an amplitude spectrum;

a noise spectrum unit configured to obtain a noise spectrum of the input time domain signal;

a signal to noise calculator configured to obtain a signal to noise ratio from the amplitude spectrum and the noise spectrum;

a perceptual weight controller configured to control, based on the signal to noise ratio, first and second perceptual weights;

a spectrum subtracter configured to subtract from said amplitude spectrum a product of said noise spectrum and the first perceptual weight as controlled by said perceptual weight controller;

a spectrum amplitude suppressor configured to multiply a spectrum obtained from said spectrum subtracter by the second perceptual weight as controlled by said perceptual weight controller, the perceptual weight controller configured to control the second perceptual weight such that the amount of amplitude suppression by the spectrum amplitude suppressor decreases for at least a portion of the spectrum obtained from the spectrum subtracter as the signal-to-noise ratio increases; and

a frequency to time converter configured to convert an output of said spectrum amplitude suppressor to a time domain signal.

Claim 2 (Previously Presented): The noise suppression device as recited in claim 1, wherein said perceptual weight controller is operable to let said first and second perceptual weights become larger at certain frequencies with increased signal to noise ratios while letting said first and second perceptual weights be smaller at frequencies with reduced signal to noise ratios.

Claim 3 (Previously Presented): The noise suppression device as recited in claim 1, further comprising: a perceptual weight modifier configured to modify at least one of the first and second perceptual weights at a ratio of a high frequency power to a low frequency power of any one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input signal amplitude spectrum and the noise spectrum.

Claim 4 (Previously Presented): The noise suppression device as recited in claim 1, further comprising: a perceptual weight modifier configured to modify the first and second perceptual weights based on a determination result as to whether an input signal is a noise or an audio component.

Claim 5 (Previously Presented): The noise suppression device as recited in claim 1, wherein the spectrum subtracter is further configured to perform fill-up processing, when a subtraction result of said spectrum subtracter is negative or zero, to a spectrum obtained by multiplying a third perceptual weight to a specified spectrum.

Claim 6 (Original): The noise suppression device as recited in claim 5, wherein said specified spectrum is one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input amplitude spectrum and the noise spectrum.

Claim 7 (Previously Presented): The noise suppression device as recited in claim 5, further comprising means for modifying the third perceptual weight at a ratio of a high frequency power to a low frequency power of at least one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input signal amplitude spectrum and the noise spectrum.

Claim 8 (Currently Amended): The noise suppression device as recited in claim 5, further comprising means for controlling the third perceptual weight based on the signal to noise ratio.

Claim 9 (Previously Presented): The noise suppression device as recited in claim 5, further comprising a perceptual weight adjuster configured to adjust the third perceptual weight in value through multiplication of a ratio of an input signal amplitude spectrum and an average noise spectrum.

Claim 10 (Original): The noise suppression device as recited in claim 1, wherein at least one perceptual weight is externally controlled or selected.

Claim 11 (Previously Presented): The noise suppression device as recited in claim 1, further comprising: a noise similarity analyzer configured to obtain a coefficient based on a

noise similarity level of the input time domain signal, wherein the noise spectrum unit is further configured to obtain the noise spectrum based on the coefficient and the amplitude spectrum.

Claim 12 (Currently Amended): A method for noise suppression, comprising:

generating an amplitude spectrum from an input time domain signal;

generating a noise spectrum of the input time domain signal;

determining a signal to noise ratio from the amplitude spectrum and the noise spectrum;

controlling, based on the signal to noise ratio, a first perceptual weight and a second perceptual weight;

subtracting from the amplitude spectrum a product of the noise spectrum and the first perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-removed spectrum;

multiplying the noise-removed spectrum by the second perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-suppressed spectrum;

controlling the second perceptual weight such that an amount of noise suppression decreases for at least a portion of the noise-removed spectrum, as the signal-to-noise ratio increases; and

converting the noise-suppressed spectrum to an output time domain signal.

Claim 13 (Previously Presented): The method as recited in claim 12, wherein the step of controlling comprises:

increasing the first perceptual weight and the second perceptual weight at frequencies with increased signal to noise ratios; and

decreasing the first perceptual weight and the second perceptual weight at frequencies with reduced signal to noise ratios.

Claim 14 (Previously Presented): The method as recited in claim 12, further comprising: modifying at least one of the first perceptual weight and the second perceptual weight at a ratio of a high frequency power to a low frequency power of any one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input signal amplitude spectrum and the noise spectrum.

Claim 15 (Previously Presented): The method as recited in claim 12, further comprising: modifying the first perceptual weight and the second perceptual weight, based on a determination result as to whether an input signal is a noise component or an audio component.

Claim 16 (Previously Presented): The method as recited in claim 12, further comprising: performing fill-up processing, when a subtraction result of said spectrum subtracter is negative or zero, to a spectrum obtained by multiplying a third perceptual weight to a specified spectrum.

Claim 17 (Previously Presented): The method as recited in claim 16, wherein said specified spectrum is one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input amplitude spectrum and the noise spectrum.

Claim 18 (Previously Presented): The method as recited in claim 16, further comprising: modifying the third perceptual weight at a ratio of a high frequency power to a low frequency power of at least one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input signal amplitude spectrum and the noise spectrum.

Claim 19 (Previously Presented): The method as recited in claim 16, further comprising: controlling the third perceptual weight based on the signal to noise ratio.

Claim 20 (Previously Presented): The method as recited in claim 16, further comprising: adjusting the third perceptual weight in value through multiplication of a ratio of an input signal amplitude spectrum and an average noise spectrum.

Claim 21 (Currently Amended): The method as recited in claim [[1]] 12, wherein the step of controlling comprises: externally selecting one of the first perceptual weight and the second perceptual weight.

Claim 22 (Currently Amended): The method as recited in Claim [[1]] 12, further comprising: determining a coefficient from a noise similarity level of the input time domain signal,

wherein the step of generating the noise spectrum comprises: generating the noise spectrum based on the coefficient and the amplitude spectrum.

Claim 23 (Currently Amended): A noise suppression device comprising:

a time to frequency converter configured to perform frequency analyzation of an input time domain signal for conversion to an amplitude spectrum;

a circuit noise spectrum unit configured to obtain a noise spectrum of the input time domain signal;

signal to noise calculator configured to obtain a signal to noise ratio from the amplitude spectrum and the noise spectrum;

a perceptual weight controller configured to control, based on the signal to noise ratio, first and second perceptual weights;

means for subtracting from the amplitude spectrum a product of the noise spectrum and the first perceptual weight as controlled by the perceptual weight controller;

means for multiplying a spectrum obtained from the means for subtracting by the second perceptual weight as controlled by the perceptual weight controller, the perceptual weight controller configured to control the second perceptual weight such that an amount of amplitude suppression by the means for multiplying decreases for at least a portion of the spectrum obtained from the means for subtraction as the signal-to-noise ratio increases; and

a frequency to time converter configured to convert an output of the means for multiplying to a time domain signal.

Claim 24 (Currently Amended): A noise-suppressed time domain signal generated by a noise suppression method comprising:

generating an amplitude spectrum from an input time domain signal;

generating a noise spectrum of the input time domain signal;

determining a signal to noise ratio from the amplitude spectrum and the noise spectrum;

controlling, based on the signal to noise ratio, a first perceptual weight and a second perceptual weight;

subtracting from the amplitude spectrum a product of the noise spectrum and the first perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-removed spectrum;

multiplying the noise-removed spectrum by the second perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-suppressed spectrum;

controlling the second perceptual weight such that an amount of noise suppression decreases for at least a portion of the noise-removed spectrum, as the signal-to-noise ratio increases; and

converting the noise-suppressed spectrum to an output time domain signal.

Claim 25 (Currently Amended): A noise suppression device for suppressing noise other than an objective signal contained in an input signal, comprising:

means for controlling first and second perceptual weights for use in performing perceptual weighting, according to the input signal; ~~and~~

means for performing a spectral subtraction on a signal ~~corresponding to~~ derived from a spectrum of said input signal, using said controlled first perceptual weight, and for performing a spectral amplitude suppression on an other signal derived from the spectrum of said input signal, using said controlled second perceptual weight, ~~about another signal corresponding to the spectrum of said input signal~~ to produce a spectrally subtracted and amplitude suppressed signal; and

means for controlling the second perceptual weight such that the amount of amplitude suppression decreases for at least a portion of the other signal derived from the spectrum of the input signal, as the signal-to-noise ratio increases.

Claim 26 (Currently Amended): The noise suppression device set forth in claim 25, further comprising:

means for controlling the first perceptual weight in such a way as to let the subtraction amount increase with increasing signal-to-noise ratio~~; and~~

~~means for controlling the second perceptual weight in such a way as to let the amplitude suppression amount decrease with increasing signal-to-noise ratio~~.

Claim 27 (Previously Presented): The noise suppression device set forth in 26, further comprising means for performing perceptual weighting with the first and second perceptual weights according to the frequency of the spectrum of the input signal.

Claim 28 (Previously Presented): The noise suppression device set forth in claim 25, further comprising means for performing perceptual weighting with the first perceptual weight according to a gradient in such a way as to let the subtraction amount decrease with increasing frequency of the spectrum of the input signal.

Claim 29 (Previously Presented): The noise suppression device set forth in claim 28, further comprising means for controlling the gradient of the first perceptual weight in such a way as to become steep with increasing signal-to-noise ratio.

Claim 30 (Previously Presented): The noise suppression device set forth in claim 25, further comprising means for performing perceptual weighting with the second perceptual weight according to a gradient in such a way as to let the amplitude suppression amount increase with increasing frequency of the spectrum of the input signal.

Claim 31 (Previously Presented): The noise suppression device set forth in claim 30, further comprising means for controlling the gradient of the second perceptual weight in such a way as to become moderate with increasing signal-to-noise ratio.

Claim 32 (Currently Amended): The noise suppression device set forth in claim 25, further comprising means for performing perceptual weighting with the first perceptual weight according to a gradient in such a way as to let the subtraction amount decrease with increasing frequency of the spectrum of the input signal; and

means for performing perceptual weighting with the second perceptual weight according to a gradient in such a way as to let the amplitude suppression amount increase with increasing frequency of the spectrum of the input signal.

Claim 33 (Previously Presented): The noise suppression device set forth in claim 32, further comprising means for controlling the gradient of the first perceptual weight in such a way as to become steep with increasing signal-to-noise ratio; and

further comprising means for controlling the gradient of the second perceptual weight in such a way as to become moderate with increasing signal-to-noise ratio.

Claim 34 (Previously Presented): The noise suppression device set forth in 25, further comprising means for performing perceptual weighting with the first and the second perceptual weights according to the frequency of the spectrum of the input signal.

Claim 35 (Currently Amended): A noise suppression method of suppressing noise other than an objective signal contained in an input signal, comprising the steps of:

controlling first and second perceptual weights for use in performing perceptual weighting, according to the input signal;

performing a spectral subtraction on a signal ~~corresponding to~~ derived from a spectrum of said input signal, using said controlled first perceptual weight, and a spectral amplitude suppression ~~using said controlled second perceptual weight about~~ on ~~another~~ an other signal ~~corresponding to~~ derived from the spectrum of said input signal, using said controlled second perceptual weight, to produce a spectrally subtracted and amplitude suppressed signal; and

controlling the second perceptual weight such that the amount of amplitude suppression decreases for at least a portion of the other signal derived from the spectrum of the input signal, as the signal-to-noise ratio increases.

Claim 36 (Currently Amended): A noise suppression device for suppressing noise other than an objective signal contained in an input signal, comprising:

a perceptual weight controller configured to control first and second perceptual weights for use in performing perceptual weighting, according to the input signal;

a spectrum subtractor configured to perform a spectral subtraction on a signal ~~corresponding to~~ derived from a spectrum of said input signal, using said controlled first perceptual weight; and

a spectrum amplitude suppressor configured to perform a spectral amplitude suppression ~~using said controlled second perceptual weight about~~ on ~~another~~ an other signal ~~corresponding to~~ derived from the spectrum of said input signal, using said controlled second perceptual weight,

the perceptual weight controller configured to control the second perceptual weight such that the amount of amplitude suppression decreases for at least a portion of the other signal derived from the spectrum of the input signal, as the signal-to-noise ratio increases.

Claim 37 (New): A noise suppression device comprising:

a time to frequency converter configured to perform frequency analyzation of an input time domain signal for conversion to an amplitude spectrum;

a noise spectrum unit configured to obtain a noise spectrum of the input time domain signal;

a signal to noise calculator configured to obtain a signal to noise ratio from the amplitude spectrum and the noise spectrum;

a perceptual weight controller configured to control, based on the signal to noise ratio, first and second perceptual weights;

a spectrum subtracter configured to subtract from said amplitude spectrum a product of said noise spectrum and the first perceptual weight as controlled by said perceptual weight controller;

a spectrum amplitude suppressor configured to multiply a spectrum obtained from said spectrum subtracter by the second perceptual weight as controlled by said perceptual weight controller, the perceptual weight controller configured to control the second perceptual weight such that the amount of amplitude suppression by the spectrum amplitude suppressor decreases for at least a portion of the spectrum obtained from the spectrum subtracter as the signal-to-noise ratio increases;

a frequency to time converter configured to convert an output of said spectrum amplitude suppressor to a time domain signal; and

a perceptual weight modifier configured to modify at least one of the first and second perceptual weights at a ratio of a high frequency power to a low frequency power of any one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input signal amplitude spectrum and the noise spectrum.

Claim 38 (New): A noise suppression device comprising:

a time to frequency converter configured to perform frequency analyzation of an input time domain signal for conversion to an amplitude spectrum;

a noise spectrum unit configured to obtain a noise spectrum of the input time domain signal;

a signal to noise calculator configured to obtain a signal to noise ratio from the amplitude spectrum and the noise spectrum;

a perceptual weight controller configured to control, based on the signal to noise ratio, first and second perceptual weights;

a spectrum subtracter configured to subtract from said amplitude spectrum a product of said noise spectrum and the first perceptual weight as controlled by said perceptual weight controller;

a spectrum amplitude suppressor configured to multiply a spectrum obtained from said spectrum subtracter by the second perceptual weight as controlled by said perceptual weight controller, the perceptual weight controller configured to control the second perceptual weight such that the amount of amplitude suppression by the spectrum amplitude suppressor decreases for at least a portion of the spectrum obtained from the spectrum subtracter as the signal-to-noise ratio increases;

a frequency to time converter configured to convert an output of said spectrum amplitude suppressor to a time domain signal,

wherein the spectrum subtracter is further configured to perform fill-up processing, when a subtraction result of said spectrum subtracter is negative or zero, to a spectrum obtained by multiplying a third perceptual weight to a specified spectrum; and

means for modifying the third perceptual weight at a ratio of a high frequency power to a low frequency power of at least one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input signal amplitude spectrum and the noise spectrum.

Claim 39 (New): A noise suppression device comprising:

a time to frequency converter configured to perform frequency analyzation of an input time domain signal for conversion to an amplitude spectrum;

a noise spectrum unit configured to obtain a noise spectrum of the input time domain signal;

a signal to noise calculator configured to obtain a signal to noise ratio from the amplitude spectrum and the noise spectrum;

a perceptual weight controller configured to control, based on the signal to noise ratio, first and second perceptual weights;

a spectrum subtracter configured to subtract from said amplitude spectrum a product of said noise spectrum and the first perceptual weight as controlled by said perceptual weight controller;

a spectrum amplitude suppressor configured to multiply a spectrum obtained from said spectrum subtracter by the second perceptual weight as controlled by said perceptual weight controller, the perceptual weight controller configured to control the second perceptual weight such that the amount of amplitude suppression by the spectrum amplitude suppressor decreases for at least a portion of the spectrum obtained from the spectrum subtracter as the signal-to-noise ratio increases;

a frequency to time converter configured to convert an output of said spectrum amplitude suppressor to a time domain signal,

wherein the spectrum subtracter is further configured to perform fill-up processing, when a subtraction result of said spectrum subtracter is negative or zero, to a spectrum obtained by multiplying a third perceptual weight to a specified spectrum; and

means for controlling the third perceptual weight based on the signal to noise ratio.

Claim 40 (New): A noise suppression device comprising:

a time to frequency converter configured to perform frequency analyzation of an input time domain signal for conversion to an amplitude spectrum;

a noise spectrum unit configured to obtain a noise spectrum of the input time domain signal;

a signal to noise calculator configured to obtain a signal to noise ratio from the amplitude spectrum and the noise spectrum;

a perceptual weight controller configured to control, based on the signal to noise ratio, first and second perceptual weights;

a spectrum subtracter configured to subtract from said amplitude spectrum a product of said noise spectrum and the first perceptual weight as controlled by said perceptual weight controller;

a spectrum amplitude suppressor configured to multiply a spectrum obtained from said spectrum subtracter by the second perceptual weight as controlled by said perceptual weight controller, the perceptual weight controller configured to control the second perceptual weight such that the amount of amplitude suppression by the spectrum amplitude suppressor decreases for at least a portion of the spectrum obtained from the spectrum subtracter as the signal-to-noise ratio increases;

a frequency to time converter configured to convert an output of said spectrum amplitude suppressor to a time domain signal,

wherein the spectrum subtracter is further configured to perform fill-up processing, when a subtraction result of said spectrum subtracter is negative or zero, to a spectrum obtained by multiplying a third perceptual weight to a specified spectrum; and

a perceptual weight adjuster configured to adjust the third perceptual weight in value through multiplication of a ratio of an input signal amplitude spectrum and an average noise spectrum.

Claim 41 (New): A method for noise suppression, comprising:

generating an amplitude spectrum from an input time domain signal;

generating a noise spectrum of the input time domain signal;

determining a signal to noise ratio from the amplitude spectrum and the noise spectrum;

controlling, based on the signal to noise ratio, a first perceptual weight and a second perceptual weight;

subtracting from the amplitude spectrum a product of the noise spectrum and the first perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-removed spectrum;

multiplying the noise-removed spectrum by the second perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-suppressed spectrum;

controlling the second perceptual weight such that an amount of noise suppression decreases for at least a portion of the noise-removed spectrum, as the signal-to-noise ratio increases;

converting the noise-suppressed spectrum to an output time domain signal; and

modifying at least one of the first perceptual weight and the second perceptual weight at a ratio of a high frequency power to a low frequency power of any one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input signal amplitude spectrum and the noise spectrum.

Claim 42 (New): A method for noise suppression, comprising:

generating an amplitude spectrum from an input time domain signal;

generating a noise spectrum of the input time domain signal;

determining a signal to noise ratio from the amplitude spectrum and the noise spectrum;

controlling, based on the signal to noise ratio, a first perceptual weight and a second perceptual weight;

subtracting from the amplitude spectrum a product of the noise spectrum and the first perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-removed spectrum;

multiplying the noise-removed spectrum by the second perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-suppressed spectrum;

controlling the second perceptual weight such that an amount of noise suppression decreases for at least a portion of the noise-removed spectrum, as the signal-to-noise ratio increases;

converting the noise-suppressed spectrum to an output time domain signal;

performing fill-up processing, when a subtraction result of said spectrum subtracter is negative or zero, to a spectrum obtained by multiplying a third perceptual weight to a specified spectrum; and

modifying the third perceptual weight at a ratio of a high frequency power to a low frequency power of at least one of an input signal amplitude spectrum, a noise spectrum, and an average spectrum of the input signal amplitude spectrum and the noise spectrum.

Claim 43 (New): A method for noise suppression, comprising:

generating an amplitude spectrum from an input time domain signal;

generating a noise spectrum of the input time domain signal;

determining a signal to noise ratio from the amplitude spectrum and the noise spectrum;

controlling, based on the signal to noise ratio, a first perceptual weight and a second perceptual weight;

subtracting from the amplitude spectrum a product of the noise spectrum and the first perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-removed spectrum;

multiplying the noise-removed spectrum by the second perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-suppressed spectrum;

controlling the second perceptual weight such that an amount of noise suppression decreases for at least a portion of the noise-removed spectrum, as the signal-to-noise ratio increases;

converting the noise-suppressed spectrum to an output time domain signal;

performing fill-up processing, when a subtraction result of said spectrum subtracter is negative or zero, to a spectrum obtained by multiplying a third perceptual weight to a specified spectrum; and

controlling the third perceptual weight based on the signal to noise ratio.

Claim 44 (New): A method for noise suppression, comprising:

generating an amplitude spectrum from an input time domain signal;

generating a noise spectrum of the input time domain signal;

determining a signal to noise ratio from the amplitude spectrum and the noise spectrum;

controlling, based on the signal to noise ratio, a first perceptual weight and a second perceptual weight;

subtracting from the amplitude spectrum a product of the noise spectrum and the first perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-removed spectrum;

multiplying the noise-removed spectrum by the second perceptual weight controlled on the basis of the signal to noise ratio, to generate a noise-suppressed spectrum;

controlling the second perceptual weight such that an amount of noise suppression decreases for at least a portion of the noise-removed spectrum, as the signal-to-noise ratio increases;

converting the noise-suppressed spectrum to an output time domain signal;

performing fill-up processing, when a subtraction result of said spectrum subtracter is negative or zero, to a spectrum obtained by multiplying a third perceptual weight to a specified spectrum; and

adjusting the third perceptual weight in value through multiplication of a ratio of an input signal amplitude spectrum and an average noise spectrum.

Claim 45 (New): A noise suppression device for suppressing noise other than an objective signal contained in an input signal, comprising:

means for controlling first and second perceptual weights for use in performing perceptual weighting, according to the input signal;

means for performing a spectral subtraction on a signal derived from a spectrum of said input signal, using said controlled first perceptual weight, and for performing a spectral amplitude suppression on an other signal derived from the spectrum of said input signal,

using said controlled second perceptual weight, to produce a spectrally subtracted and amplitude suppressed signal;

means for controlling the second perceptual weight such that the amount of amplitude suppression decreases for at least a portion of the other signal derived from the spectrum of the input signal, as the signal-to-noise ratio increases; and

means for performing perceptual weighting with the second perceptual weight according to a gradient in such a way as to let the amplitude suppression amount increase with increasing frequency of the spectrum of the input signal.

Claim 46 (New): The noise suppression device set forth in claim 45, further comprising means for controlling the gradient of the second perceptual weight in such a way as to become moderate with increasing signal-to-noise ratio.

Claim 47 (New): A noise suppression device for suppressing noise other than an objective signal contained in an input signal, comprising:

means for controlling first and second perceptual weights for use in performing perceptual weighting, according to the input signal;

means for performing a spectral subtraction on a signal derived from a spectrum of said input signal, using said controlled first perceptual weight, and for performing a spectral amplitude suppression on an other signal derived from the spectrum of said input signal, using said controlled second perceptual weight, to produce a spectrally subtracted and amplitude suppressed signal;

means for controlling the second perceptual weight such that the amount of amplitude suppression decreases for at least a portion of the other signal derived from the spectrum of the input signal, as the signal-to-noise ratio increases;

means for performing perceptual weighting with the first perceptual weight according to a gradient in such a way as to let the subtraction amount decrease with increasing frequency of the spectrum of the input signal; and

means for performing perceptual weighting with the second perceptual weight according to a gradient in such a way as to let the amplitude suppression amount increase with increasing frequency of the spectrum of the input signal.

Claim 48 (New): The noise suppression device set forth in claim 47, further comprising means for controlling the gradient of the first perceptual weight in such a way as to become steep with increasing signal-to-noise ratio; and

further comprising means for controlling the gradient of the second perceptual weight in such a way as to become moderate with increasing signal-to-noise ratio.